

REMARKS

Claims 24-57 are pending in this application. Claims 1-23, being non-elected claims, are hereby cancelled pending the possible filing of a divisional application. Claims 24, 25 and 49 are amended and claim 57 is added herein. Applicant respectfully requests reconsideration of the claims in view of the following remarks.

The Office Action indicated that Figures 2a, 2b and 2c need a legend such as --Prior Art --. In response, replacement sheets for these figures have been provided herewith. Each of these figures now includes a prior art legend.

The specification has been objected to because the brief description of the drawings refers to Figure 1 (as well as Figures 2a-2c) as part of "the present invention." Each of these descriptions has been modified to refer to the prior art, which is consistent with the background.

Claim 49 has been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 49 has been amended to clearly recite the relationship of forming the isolation regions with the remainder of the claim.

Independent claim 24 was rejected under 35 U.S.C. § 102(e) as being anticipated by Inaba, *et al.* (U.S. Patent No. 6,525,403) and dependent claims 25-31 and 33-47 have been rejected in view of Inaba, *et al.*, either singly or in combination with other references. Claim 32 was not rejected (or indicated as being allowable). Applicant respectfully traverses this rejection.

Since claim 32 was not rejected, any final rejection of this claim would be improper.

Claim 24 has been amended to include the limitation of originally filed claim 25 and now recites that "the source-substrate junction or drain-substrate junction [is] higher than the bottom

surface of the gate electrode by at least about 50 angstroms." Applicant respectfully submits that claim 24 is allowable over the references of record.

In discussing claim 25, the Office Action admitted that Inaba, *et al.* does not teach that the source-substrate junction or drain-substrate junction is higher than the bottom surface of the gate electrode by at least about 50 angstroms. The Office Action then concluded that parameters such as height are subject to routine experimentation and optimization to achieve the desired device quality. Applicant respectfully disagrees with this conclusion.

While the figures seem to illustrate the original limitation of the last clause of the original claim 24 (see e.g., Inaba, *et al.*'s Figure 11c and 11d), Inaba, *et al.* does not make any teaching of how the source and drain 15 could be formed above the bottom surface of the gate electrode. To form Inaba, *et al.*'s source and drain regions, "phosphorous (P) or arsenic (As) is introduced into the side surfaces of the projection except below the gate electrode by means of ion implantation. The ion implantation is carried out in a self-aligned manner using the gate electrode 14 as a mask." Col. 4, lines 43-48. Inaba, *et al.* never explains how one could prevent dopants from being implanted in portions of the projection 11A near the top surface of insulator 12, much less any desirability of such a limitation. One of ordinary skill in the art reading Inaba, *et al.*'s disclosure would not be taught to leave any distance between the insulating surface and the source/drain regions 15.

The Office Action states parameters such as height are subject to routine experimentation on optimization to achieve the desired device quality during fabrication. Applicant respectfully submits that this conclusion does not apply in this situation. First, nothing in the prior art teaches or suggests how one could perform an ion implantation into a side surface without implanting the entire surface. Without an enabling teaching, the prior art cannot anticipate the claim. MPEP §

2121.01 ("The disclosure in an assertedly anticipating reference must provide an enabling disclosure of the desired subject matter; mere naming or description of the subject matter is insufficient, if it cannot be produced without undue experimentation." Citing *Elan Pharm., Inc. v. Mayo Foundation for Medical and Education Research*, 346 F.3d 1051, 1054, 68 USPQ2d 1373, 1376 (Fed. Cir. 2003)).

Second, nothing in the prior art teaches that providing a source-substrate junction or drain-substrate junction that is higher than the bottom surface of the gate electrode would be desired (as suggested in the Office Action). Applicants own disclosure teaches this desirability.

As stated in Paragraph [0038]:

Figure 4c also shows a potential leakage current path 156 between the source and the drain regions 138 and 140. The gate electrode 146 above or below the plane of the page (i.e., plane 4c-4c') is drawn in dashed lines in Figure 4c, showing that the gate electrode 146 is in the vicinity of the potential leakage current path. Therefore, by having the gate electrode 146 extend below the source-substrate junction 154 or the drain-substrate junction 152, and positioning the gate electrode 146 in the vicinity of the potential leakage path 156, this embodiment ensures that the gate electrode 146 exerts considerable influence on the potential leakage path 156 to suppress the leakage.

The Inada reference does not teach or suggest this reason (or any other reason) for spacing the source-substrate or drain-substrate junction from the gate electrode. The Office Action states that it would have been obvious to adjust the source-substrate junction and the drain-substrate junction "in order to improve heat conductivity and minimize current degradation caused by heat due to Joule effect." The Office Action, however, fails to provide any support whatsoever for this conclusion. Applicant can find no indication of any place in the prior art that suggests adjusting the location of junctions to improve heat conductivity or minimize current degradation. Without any such teaching, the obviousness rejection cannot apply.

Therefore, it is respectfully submitted that claim 24 is allowable over the references of record.

Claims 25-47 depend from claim 24 and add further limitations. It is respectfully submitted that these dependent claims are allowable by reason of depending from an allowable claim as well as for adding new limitations.

Independent claim 48 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Inaba, *et al.* in view of Yu, *et al.* (U.S. Patent No. 6,764,884). Dependent claims 49-56 have been rejected in view of Inaba, *et al.* and Yu, *et al.*, either together or in combination with other references. Applicant respectfully traverses these rejections.

Claim 48, as originally filed, specifically recites "forming a region of material adjacent portions of the semiconductor fin not underlying the gate electrode such that a sidewall of the semiconductor fin extends above an upper surface of the region of material; and doping the sidewall of the semiconductor fin above the region of material." Applicant respectfully submits that the references of record do not teach or suggest the limitations of claim 48.

The Office Action admits that Inaba, *et al.* does not teach forming a region of material adjacent portions of the semiconductor fin not underlying the gate electrode such that a sidewall of the semiconductor fin extends above an upper surface of the region of material. The Office Action points to Yu, *et al.*, which teaches spacer regions 410 in Figure 4. Yu, *et al.*, however, never teaches forming a region of material adjacent portions of the semiconductor fin not underlying the gate electrode such that a sidewall of the semiconductor fin extends above an upper surface of the region of material. Figure 4 clearly shows that there is no sidewall that extends above an upper surface of the spacer 410. Since neither reference teaches each element the claimed invention, the combination of references cannot teach the claimed invention.

Claims 49-56 depend from claim 48 and add further limitations. It is respectfully submitted that these dependent claims are allowable by reason of depending from an allowable claim as well as for adding new limitations.

Applicant has made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Ira S. Matsil, Applicant's attorney, at 972-732-1001 so that such issues may be resolved as expeditiously as possible. No fee is believed due in connection with this filing. However, should one be deemed due, the Commissioner is hereby authorized to charge Deposit Account No. 50-1065.

Respectfully submitted,



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Date

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